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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,772	07/28/2003	Paul Stephen McLeod	STL 3243	7574

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EXAMINER
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VERSTEEG, STEVEN H

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 04/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/629,772

Applicant(s)

MCLEOD, PAUL STEPHEN

Examiner

Steven H. VerSteeg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 April 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-15, 17 and 18 is/are rejected.
- 7) ☒ Claim(s) 7, 16 and 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/19/04</u> . | 6) <input checked="" type="checkbox"/> Other: <u>IDS received 7/28/03</u> .             |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-18 and 20, drawn to a sputter system and method of sputtering, classified in class 204, subclass 192.12.
  - II. Claim 19, drawn to a magnetic recording medium, classified in class 428, subclass 692.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as apparatus and product made. The inventions in this relationship are distinct if either or both of the following can be shown: (1) that the apparatus as claimed is not an obvious apparatus for making the product and the apparatus can be used for making a different product or (2) that the product as claimed can be made by another and materially different apparatus (MPEP § 806.05(g)). In this case the apparatus as claimed is not an obvious apparatus for making the product and can be used for making an integrated circuit.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Jesus Del Castillo on April 4, 2005 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-18 and 20. Affirmation of this election must be made by applicant in replying to this Office action. Claim 19 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Information Disclosure Statement***

5. The US references crossed out on the IDS are duplicates. The foreign reference crossed out has not been received. Please re-submit the foreign reference and I will resend an initialed IDS with the next communication.

***Drawings***

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **170** [0008]; **305**, **310**, **315**, **320**, **325**, and **330** [0031]; and **430** [0035]. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: **510** and **565** (see Figures 5A-5D). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the

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immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

8. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “730” has been used to designate both “curve” and “second bias voltage” (see [0044]). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

9. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

10. The disclosure is objected to because of the following informalities: “180” should be “480” and [0033], line 1; and “187” should be “487” at [0039], line 6.

Appropriate correction is required.

***Claim Objections***

11. Claims 4, 5, and 20 are objected to because of the following informalities: “said plurality target-cathodes” in claim 4 at lines 1-2 should be “said plurality of target-cathodes”; and “cathodes” should be “cathode” in claim 20 at line 6. Claim 5 depends from claim 4 and contains all of the limitations of claim 4. Therefore, claim 5 is objected to for the same reasons as claim 4. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

12. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. Claims 14 and 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

14. Claim 14 recites the limitation "the adjacent sets of targets" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

15. Claim 20 recites the limitation "said plurality of target-cathodes" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

16. Claim 20 recites the limitation "said at least one target-cathodes" in lines 5-6. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

17. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

18. Claims 1-6, 8-15, 17, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6,338,777 B1 to Longstreth White.

19. For claim 1, Applicant requires a sputter system comprising a pallet capable of being biased at a plurality of different bias voltages, the pallet being movable along a path of travel; a plurality of target-cathodes disposed along the path of travel wherein each target-cathode can be powered at different voltages; and a controller configured to selectively vary the target-cathode voltage and the pallet bias voltage while the pallet moves along the path of travel and the pallet is in front of more than one of the plurality of target cathodes.

20. For claim 12, Applicant requires a method of sputtering layers of materials onto substrates carried by a pallet comprising moving the pallet along a path of travel, applying a bias voltage to the pallet that is variable; applying a plurality of voltages to a plurality of target-cathodes for sputtering the material from the cathodes; and selectively varying the plurality of targets voltages and the pallet bias while the pallet is moving in front of the targets.

21. Longstreth White discloses a sputtering apparatus and method (title) comprising a pallet (col. 5, l. 55-58) of substrates 31 that are pulsed biased (col. 5, l. 58-63) while the substrate is moved through an in-line system; a plurality of target-cathodes **35a**, **35b**, **36a**, **36b** along the path of travel (Figure 3) where each target is powered at different voltages based upon the fact that the adjacent target-cathodes are driven in opposite phase (col. 4, l. 37-51); and a controller that selectively pulses and hence, varies the target-cathode voltage and pallet bias while the pallet moves through the path of travel (col. 4, l. 60 – col. 5, l. 6) and the pallet is in front of more than one of the plurality of target-cathodes (Figure 3).

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22. For claim 2, Applicant requires the target-cathodes to be spaced apart along the path of travel by a distance less than a length of the pallet. For claim 14, Applicant requires providing adjacent sets of targets spaced apart along the path of travel by a distance less than a length of the pallet. The limitation appears to be shown by Figure 3, but the limitation is also inherent because both cathodes are used to deposit onto the substrate in alternating fashion (i.e. when one is a cathode, the other is an anode) and Figure 3 shows only one direction of movement (i.e. not back and forth between targets).

23. For claim 3, Applicant requires the target-cathodes to be disposed on both sides of the path of travel. Figure 3 shows the limitation.

24. For claim 4, Applicant requires the plurality of target-cathodes to include target of different materials wherein each material is characterized by a preferred pallet bias voltage. Multiple different layers are deposited from multiple different targets (col. 7, l. 56-58). The bias voltage for the pallet, even if identical for each deposition, is considered a preferred pallet bias voltage.

25. For claim 5, Applicant requires the plurality of target-cathodes to be successively set to their respective preferred pallet bias voltages. Again, the bias voltage for the pallet, even if identical for each deposition, is considered to be a preferred pallet bias voltage and is inherently set so the deposition can proceed.

26. For claim 6, Applicant requires the controller to be configured to supply a voltage bias to pairs of cathode targets in turn within a cycle time. The controller supplies the bias to each cathode in turn because the phase controller controls when each individual target is acting as an anode and as a cathode.



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27. For claims 8 and 15, Applicant requires the pallet to be configured to move a minimal distance along the path of travel within the cycle time. Because the pallet is moving, it is inherent that it moves a minimal distance.

28. For claims 9 and 18, Applicant requires a schedule for selectively supplying voltages according to time. The control means synchronizes the phase and hence, uses a schedule.

29. For claims 10 and 17, Applicant requires a schedule for selectively supplying voltages according to position of the pallet. When the pallet is not in front of the cathodes, the cathodes are inherently not operated else waste would occur.

30. For claim 11, Applicant requires the schedule to include timing and sequencing of voltage information. As noted above, the controller synchronizes the power supply. Hence, the timing and sequencing of the voltage is scheduled.

31. For claim 13, Applicant requires selectively varying the target voltages and pallet bias according to a predetermined sequence. As noted above, the controller synchronizes and hence, uses a predetermined sequence.

***Claim Rejections - 35 USC § 103***

32. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

33. Claims 1, 4-6, 8-15, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,290,821 B1 to McLeod in view of US 6,036,824 to Hedgcoth.

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34. Claims 1, 4-6, 8-15, 17, and 18 are described above. McLeod discloses a sputter deposition apparatus and method comprising applying a time varying bias to the substrate (abstract) and pulsed sputtering power to cathodes (col. 6, l. 32-37). The targets are of different materials (col. 6, l. 20-27). The pulsed power shows that the targets are powered at different voltages. A controller controls each individual sputter target (Figure 2). Because the pallet is moved and the controller controls, there is inherently a schedule.

35. McLeod does not disclose using a pallet with multiple substrates moving through the system.

36. Hedgcoth discloses that it is beneficial to use a pallet containing multiple substrates to process multiple substrates simultaneously (Figure 2).

37. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of McLeod to utilize a pallet containing multiple substrates because of the desire to process multiple substrates simultaneously.

***Allowable Subject Matter***

38. Claims 7 and 16 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

39. Claim 20 would be allowable if written to overcome the claim objection presented above.

40. The following is a statement of reasons for the indication of allowable subject matter: it is neither anticipated nor obvious to have a sputter system as claimed by Applicant in claim 1; or a method of sputtering layers of material onto substrate carried by a pallet as claimed by Applicant in claim 16; or a sputter system as claimed by Applicant in claim 20.

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41. Neither McLeod nor Hedgcoth nor Longstreth White discloses or suggests synchronizing the bias voltage on the pallet with the target-cathode voltage. Modifying any of the references of record to provide such a limitation would involve hindsight.

### ***General Information***

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (571) 272-1700.

For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Denis Boyd at (571) 272-0992.

For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (571) 272-1300.

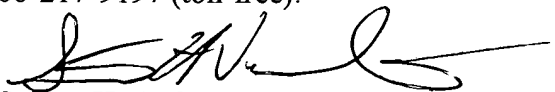
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. VerSteeg whose telephone number is (571) 272-1348. The examiner can normally be reached on Mon - Thurs (6:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Steven H VerSteeg  
Primary Examiner  
Art Unit 1753

shv  
April 5, 2005